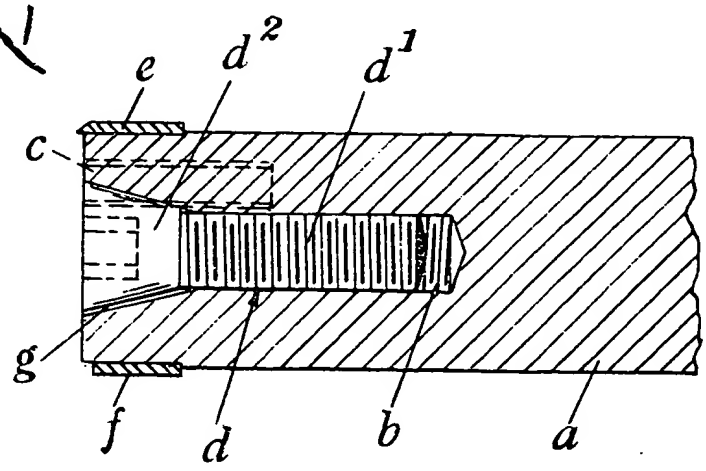

Fig.1

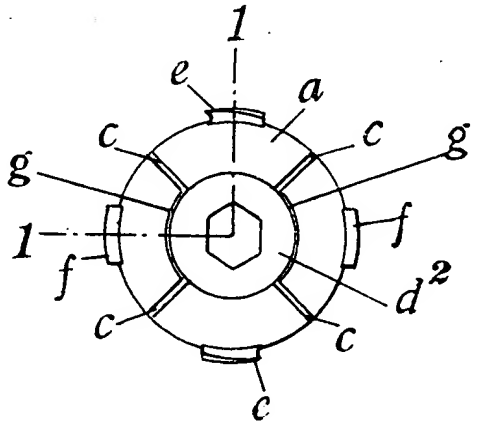

Fig.2

H.M.S.O.(Ty.P.)

PATENT SPECIFICATION

594473

Application Date: Feb. 6, 1945. No. 3003/45.

Complete Specification Left: Jan. 16, 1946.

Complete Specification Accepted: Nov. 12, 1947.

PROVISIONAL SPECIFICATION

Improvements relating to Reamers, Boring Tools and the like

We, GEORGE H. ALEXANDER MACHINERY LIMITED, a British Company, of 82 to 84, Coleshill Street, in the City of Birmingham, 4, and JOHN MERVYN PERKINS, a British Subject, of The Lodge, Bilton Place, Rugby, in the County of Warwick, do hereby declare the nature of this invention to be as follows:—

This invention relates to reamers, boring tools and the like of the kind having one or more cutting edges at one end of a shank which is expansible, for adjustment of the effective diameter of the tool, by a tapered plug screwed into the said end, and which also has at the said end one or more steady pieces adapted to bear against the surface of the work piece which is being acted on by the cutting edge or edges. Ordinarily where an adjustment is made by means of the plug, the whole of the end of the shank is expanded, so that not only is the effective diameter of the cutting edge or edges increased but also that of the steady piece or pieces. For some purposes, however, it is desirable that only the cutting edge or edges shall be effected by movement of the plug, the effective diameter of the steady piece or pieces remaining constant, and the object of the present invention is to enable this requirement to be met in a simple and satisfactory manner.

The invention comprises a tool of the kind aforesaid in which the bore at the expansible end of the shank is so shaped that the plug acts only on the parts required to be adjusted.

In one application of the invention to a reamer or the like, one end of a cylindrical shank is formed with an axial bore which at its inner end is internally screw threaded and which adjacent to its outer end is tapered in the usual manner, the bored portion of the stem being severed by four equi-spaced longitudinal slots. In combination with this end is provided the usual plug which has a screw threaded part for engaging the screw threaded part of the bore and a tapered head for co-operating with the tapered part of the bore. In one example, we attach to the outer surface of each of a pair of opposite segments of the shank lying between the slots, a hard-metal cutting piece, and to the outer surface of each of the other pair of segments we attach a hardened steady piece. To achieve the object of the invention, we also form the portion of the bore associated with the latter pair of segments, with a clearance so that the plug acts only on the segments carrying the cutting pieces. When the plug is adjusted for varying the effective diameter of the cutting pieces, as for example, to compensate for wear, only the segments carrying the cutting pieces are acted on by the plug, and the effective diameter of the steady pieces remains constant.

In another example, which is essentially similar to the above, we employ only a single cutting piece, this being attached to one of the segments. In this case the opposite segment is provided with a steady piece, and steady pieces are also provided on the other two segments. When adjustment is effected, this acts on the parts carrying the cutting edges and the opposite steady piece, the effective diameter of the other two steady pieces remaining unaffected.

The invention is not, however, restricted to the above described examples, as the number of segments formed on the expansible end of the shank, and the number and arrangement of the cutting pieces and steady pieces may be varied to suit different requirements. Also instead of attaching separate cutting and steady pieces to the segmental end of the shank, either or both of such different pieces may be formed integrally with the shank.

Dated this 5th day of February, 1945.

MARKS & CLERK.

COMPLETE SPECIFICATION

Improvements relating to Reamers, Boring Tools and the like

We, GEORGE H. ALEXANDER MACHINERY LIMITED, a British Company, of 82 to 84, Coleshill Street, in the City of Birmingham, 4, and JOHN MERVYN PERKINS, a

[Price 1/-]

British Subject, of The Lodge, Bilton Place, Rugby, in the County of Warwick, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to reamers, boring tools and the like of the kind having one or more cutting edges at one end of a shank which is expansible, for adjustment of the effective diameter of the tool, by a tapered plug screwed into the said end, and which also has at the said end a plurality of steady pieces adapted to bear against the surface of the work piece which is being acted on by the cutting edge or edges. Ordinarily where an adjustment is made by means of the plug, the whole of the end of the shank is expanded, so that not only is the effective diameter of the cutting edge or edges increased but also that of the steady pieces. For some purposes, however, it is desirable that only the cutting edge or edges shall be effected by movement of the plug, the effective diameter of the steady pieces remaining constant, and the object of the present invention is to enable this requirement to be met in a simple and satisfactory manner.

The invention comprises a tool of the kind aforesaid in which the bore at the expansible end of the shank is so shaped that adjustment of the plug to vary the position of the cutting edge or edges has no effect on at least one diametrically opposite pair of steady pieces.

In the accompanying sheet of explanatory drawings:—

Figure 1 is a sectional side view and Figure 2 an end view, of a part of a reamer embodying the invention, Figure 1 being taken on the line 1—1 of Figure 2.

In carrying the invention into effect as shown, one end of a cylindrical or other shank a is formed with an axial bore b which is screw threaded along the inner part of its length and which is tapered in the usual manner at its outer end, the bored portion of the shank being severed by four equi-spaced longitudinal slots c which extend from the outer end of the shank to a position between the ends of the screw threaded part of the bore. For insertion into the bore b there is provided the usual plug d which has a screw threaded part d^1 for engaging the screw threaded part of the bore b and a tapered head d^2 for co-operating with the tapered part of the bore. To the outer surface of each of a pair of opposite segments of the shank a lying between the slots c there is attached a hard-metal cutting piece e and to the outer surface of each of the other pair of segments there is attached a hardened steady piece f. To achieve the object of the invention, we shape the tapered portion of the bore b associated with the latter pair of segments so as to provide clearance spaces g between these segments and the tapered head d^2 of the plug d. The clearance spaces g are such that when the plug d is adjusted for varying the effective diameter of the cutting pieces e, as for example, to compensate for wear, only the shank segments carrying the cutting pieces are acted on by the plug, and the effective diameter of the steady pieces f remains constant.

In another example, which is essentially similar to the above, we employ only a single cutting piece, this being attached to one of the shank segments. In this case the opposite segment is provided with a steady piece, and steady pieces are also provided on the other two segments. When adjustment is effected, the plug head acts on the parts carrying the cutting piece and the opposite steady piece, the effective diameter of the other two steady pieces remaining unaffected.

The invention is not, however restricted to the above described examples, as the number of segments formed on the expansible end of the shank, and the number and arrangement of the cutting pieces and steady pieces may be varied to suit different requirements. Also instead of attaching separate cutting and steady pieces to the segmental end of the shank, either or both of such different pieces may be formed integrally with the shank. Moreover, the invention is not limited to reamers as it may be applied in essentially the same manner to boring tools or the like.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A reamer, boring tool or the like of the kind specified, in which the bore at the expansible end of the shank is so shaped that adjustment of the plug to vary the position of the cutting edge or edges has no effect on at least one diametrically opposite pair of steady pieces.

2. A reamer, boring tool or the like as claimed in Claim 1, and having the combination and arrangement of parts substantially as described and as illustrated by the accompanying drawings.

Dated this 7th day of January, 1946.

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Leamington Spa: Printed for His Majesty's Stationery Office, by the Courier Press—1947. Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies, price 1s. 0d. each (inland) 1s. 1d. (abroad) may be obtained.